

## Claims

What is claimed is:

1. A method comprising:

modeling neural activity as a single equivalent current dipole (ECD);

calculating a best fit dipole coordinate;

computing a confidence interval for the dipole coordinate; and

displaying the confidence interval.

2. The method of claim 1, wherein the step of computing a confidence interval includes computing an error ellipsoid.

3. The method of claim 2, wherein the step of computing an error ellipsoid includes computing a main axes of the error ellipsoid using a Singular Value Decomposition.

4. The method of claim 1, wherein the step of modeling includes assuming the geometric and conductive properties of cardiac or cortical tissue.

5. The method of claim 4, wherein the step of computing a confidence interval includes the step determining field distributions for a best fit dipole coordinate and for a modified best fit dipole coordinate.

6. The method of claim 5, wherein the step of computing a confidence interval includes the step of computing the difference field distribution.

7. The method of claim 6, wherein the step of computing a confidence interval includes the step of performing a signal to noise ratio analysis.
8. The method of claim 1, and further comprising defining a Cartesian coordinate system.
9. The method of claim 1, wherein the confidence interval is overlaid on an image obtained through the use of Magnetic Resonance Imaging (MRI).
10. The method of claim 1, wherein the confidence interval is overlaid on an image obtained through the use of Computerized Tomography (CT).
11. An apparatus comprising:
  - a detector;
  - a processor adapted to receive data from the detector, the processor capable of using the data to calculate a best dipole coordinate and a confidence interval; and
  - a display in communication with the processor and adapted to display the confidence interval.
12. The apparatus of claim 11, and further comprising an imaging source in communication with the processor.
13. The apparatus of claim 12, wherein the imaging source is an MRI unit.
14. The apparatus of claim 12, wherein the imaging source is a CT scan.
15. The apparatus of claim 12, wherein the detector is an electroencephalogram.
16. The apparatus of claim 12, wherein the detector is a magnetoencephalogram.
17. A method comprising:

measuring an electrical or magnetic signal;

calculating a best fit dipole coordinate for the signal;

computing a confidence interval for the dipole coordinate; and

displaying the confidence interval on an anatomical map, wherein the confidence interval is displayed in its anatomical position.

18. The method of claim 17, wherein the step of computing a confidence interval includes computing a confidence ellipsoid axes from estimated noise level and different fields strengths.

19. The method of claim 17, wherein the step of displaying includes the step of receiving a digital image.

20. The method of claim 17, wherein the step of computing a confidence interval includes the step of computing a confidence volume.